Name: Date:

Polynomial Factoring solution (version 688)

1. **The quadratic formula says if $ax^2 + bx + c = 0$ then $x = \frac{-b \pm \sqrt{b^2-4ac}}{2a}$. Use the quadratic formula to solve the following equation.**

$$x^2 + 6x + 22 = 0$$

Simplify your answer(s) as much as possible.

Solution

$$x = \frac{-(6) \pm \sqrt{(6)^2 - 4(1)(22)}}{2(1)}$$

$$x = \frac{-(6) \pm \sqrt{36 - 88}}{2(1)}$$

$$x = \frac{-6 \pm \sqrt{-52}}{2}$$

$$x = \frac{-6 \pm \sqrt{-4 \cdot 13}}{2}$$

$$x = \frac{-6 \pm 2\sqrt{13}\, i}{2}$$

$$x = -3 \pm \sqrt{13}\, i$$

Notice that i in NOT under the square-root radical symbol!!

2. **Express the product of $5 + 9i$ and $-3 - 7i$ in standard form $(a + bi)$.**

Solution

$$(5 + 9i) \cdot (-3 - 7i)$$

$$-15 - 35i - 27i - 63i^2$$

$$-15 - 35i - 27i + 63$$

$$-15 + 63 - 35i - 27i$$

$$48 - 62i$$

Polynomial Factoring solution (version 688)

3. **Write function $f(x) = x^3 - 3x^2 - 16x - 12$ in factored form. I'll give you a hint: one factor is $(x - 6)$.**

Solution

	1	-3	-16	-12
6		6	18	12
	1	3	2	0

$$f(x) = (x-6)(x^2+3x+2)$$

$$f(x) = (x-6)(x+1)(x+2)$$

4. **Polynomial p is defined below in factored form.**

$$p(x) = (x+7)^2 \cdot (x+2) \cdot (x-1)$$

Sketch a graph of polynomial $y = p(x)$.